

AMENDMENTS TO THE CLAIMS

Please amend the pending claims as follows:

1. (previously presented) A hydrofluoric acid wastewater treatment method, comprising the following steps:

a hydrofluoric acid concentration step comprising concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor;

a dissolution step comprising bringing the hydrofluoric acid-containing vapor obtained in the hydrofluoric acid concentration step into contact with dissolution water to dissolve the vapor;

a neutralization step comprising bringing the residual hydrofluoric acid-containing vapor which has not been dissolved in the dissolution water and remains undissolved in the dissolution step into contact with an alkali to produce a neutralized liquid and a dehydrofluorinated vapor; and

a condensation step comprising condensing the dehydrofluorinated vapor obtained in the neutralization step to produce condensed water.

2. (original) A method according to claim 1 further comprising a neutralized liquid separation step comprising separating the neutralized liquid obtained in the neutralization step into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes.

3. (original) A method according to claim 1 further comprising:

a neutralized liquid concentration step comprising bringing the condensed water obtained in the condensation step into contact with an alkali and/or bringing the dehydrofluorinated vapor before condensation in the condensation step into contact with an alkali to produce a neutralized liquid, followed by concentrating the neutralized liquid by evaporation to produce a concentrated neutralized liquid and a re-dehydrofluorinated vapor; and

a concentrated neutralized liquid separation step comprising separating the concentrated neutralized liquid obtained in the neutralized liquid concentration step into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes.

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4. (original) A method according to claim 1, wherein the hydrofluoric acid concentration step further comprises concentrating by evaporation the hydrofluoric acid-containing vapor solution obtained in the dissolution step.

5. (previously presented) A hydrofluoric acid wastewater treatment method comprising the following steps:

a first concentration step comprising concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor;

a neutralization-condensation step comprising neutralizing with an alkali and condensing the hydrofluoric acid-containing vapor obtained in the first concentration step to produce a neutralized liquid;

a second concentration step comprising concentrating the neutralized liquid obtained in the neutralization-condensation step to produce a concentrated neutralized liquid; and

a separation step comprising separating the concentrated neutralized liquid obtained in the second concentration step into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes.

6. (currently amended) A hydrofluoric acid wastewater treatment device for treating wastewater containing hydrofluoric acid, comprising:

a hydrofluoric acid concentrator for concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor, the hydrofluoric acid concentrator comprising a heating unit for heating hydrofluoric acid wastewater and nozzles that spray the heated hydrofluoric acid wastewater under reduced pressure, and the hydrofluoric acid concentrator having corrosion resistance to concentrated hydrofluoric acid water;

a water contactor for bringing the hydrofluoric acid-containing vapor obtained by the concentrator into contact with dissolution water to dissolve the vapor;

a first hydrofluoric acid vapor supply line for supplying the hydrofluoric acid-containing vapor from the hydrofluoric acid concentrator to the water contactor;

an alkali contactor for bringing the hydrofluoric acid-containing vapor into contact with an alkali to produce a neutralized liquid and a dehydrofluorinated vapor;

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a second hydrofluoric acid vapor supply line for supplying residual hydrofluoric acid-containing vapor which has not been dissolved in the dissolution water and remains undissolved in the water contactor from the water contactor to the alkali contactor; and

a condenser for condensing the dehydrofluorinated vapor obtained by the alkali contactor to produce condensed water.

7. (previously presented) A hydrofluoric acid wastewater treatment device for treating wastewater containing hydrofluoric acid, comprising:

a hydrofluoric acid concentrator for concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor;

a water contactor for bringing the hydrofluoric acid-containing vapor obtained by the concentrator into contact with dissolution water to dissolve the vapor;

a hydrofluoric acid vapor supply line for supplying the hydrofluoric acid-containing vapor from the hydrofluoric acid concentrator to the water contactor;

an alkali contactor for bringing the residual hydrofluoric acid-containing vapor which has not been dissolved in the dissolution water and remains undissolved in the water contactor into contact with an alkali to produce a neutralized liquid and a dehydrofluorinated vapor;

a condenser for condensing the dehydrofluorinated vapor obtained by the alkali contactor to produce condensed water; and

a separator for separating the neutralized liquid obtained by the alkali contactor into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes.

8. (original) A hydrofluoric acid wastewater treatment device according to claim 7 further comprising a neutralization-concentration apparatus for bringing the condensed water obtained by the condenser into contact with an alkali and/or bringing the dehydrofluorinated vapor before condensation in the condenser into contact with an alkali to produce a neutralized liquid, and concentrating the neutralized liquid by evaporation to produce a concentrated neutralized liquid and a re-dehydrofluorinated vapor;

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the separator being configured to separate the concentrated neutralized liquid obtained by the neutralization-concentration apparatus and the neutralized liquid obtained by the alkali contactor together into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes.

9. (previously presented) A hydrofluoric acid wastewater treatment device for treating wastewater containing hydrofluoric acid, comprising:

a first concentrator for concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor;

a condenser for condensing the hydrofluoric acid-containing vapor obtained by the first concentrator to produce a condensate;

a neutralizer for neutralizing with an alkali the hydrofluoric acid-containing vapor or the condensate to produce a neutralized liquid;

a second concentrator for concentrating the neutralized liquid to produce a concentrated neutralized liquid;

a separator for separating the concentrated neutralized liquid obtained by the second concentrator into hydrofluoric acid-containing water, alkali-containing water and desalted water using ion exchange membranes;

a vapor supply line for supplying the hydrofluoric acid-containing vapor from the first concentrator to the condenser;

a condensate outlet line for supplying the condensate from the condenser to the second concentrator; and

an alkali supply line for supplying alkali from the neutralizer to at least one of the vapor supply line, condenser, condensed water outlet line, and second concentrator.

10. (currently amended) A hydrofluoric acid wastewater treatment device for treating wastewater containing hydrofluoric acid, comprising:

a hydrofluoric acid concentrator for concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor, the hydrofluoric acid concentrator comprising a heating unit for heating hydrofluoric acid wastewater and nozzles that spray the heated hydrofluoric acid wastewater under reduced

pressure, and the hydrofluoric acid concentrator having corrosion resistance to concentrated hydrofluoric acid water;

a water contactor configured to receive the hydrofluoric acid-containing vapor from the concentrator and bring the hydrofluoric acid-containing vapor into contact with dissolution water to dissolve the vapor;

an alkali contactor configured to receive residual hydrofluoric acid-containing vapor from the water contactor and bring the received vapor into contact with an alkali to produce a neutralized liquid and a dehydrofluorinated vapor, the residual hydrofluoric acid-containing vapor having not been dissolved in the dissolution water and remaining undissolved in the water contactor; and

a condenser for condensing the dehydrofluorinated vapor obtained by the alkali contactor to produce condensed water.

11. (previously presented) A hydrofluoric acid wastewater treatment device for treating wastewater containing hydrofluoric acid, comprising:

a hydrofluoric acid concentrator for concentrating hydrofluoric acid wastewater by evaporation to produce a concentrated hydrofluoric acid water and a hydrofluoric acid-containing vapor;

a water contactor for bringing the hydrofluoric acid-containing vapor obtained by the concentrator into contact with dissolution water to dissolve the vapor;

a hydrofluoric acid vapor supply line for supplying the hydrofluoric acid-containing vapor from the hydrofluoric acid concentrator to the water contactor;

an alkali contactor for bringing the residual hydrofluoric acid-containing vapor which has not been dissolved in the dissolution water and remains undissolved in the water contactor into contact with an alkali to produce a neutralized liquid and a dehydrofluorinated vapor;

a condenser for condensing the dehydrofluorinated vapor obtained by the alkali contactor to produce condensed water; and

a return line for supplying the hydrofluoric acid-containing vapor solution from the water contactor to the hydrofluoric acid concentrator.